Critical and Creative Thinking in the Higher-Education Classroom

Eric Mazur: "Why you can pass tests and still fail in the real world"

Today, assessment “focuses on the regurgitation of memorized information…instead of developing 21st-century skills, all we’re really doing is using assessment to rank and classify students.”

https://www.youtube.com/watch?v=P3X0i9W-c3I
Carol Dweck: “Growth vs Fixed Mindset”

“Students (especially beginning ones) are attentive (sometimes anxious, even frustrated) when there’s the possibility of more than one answer to a question. Which one is correct? Which one will get me credit on the exam?”


Ken Robinson: “How schools kill creativity”

“No the time [kids] become adults…they’re afraid of making mistakes. We stigmatize mistakes. We are now running a national education system in which mistakes are the worst things you can make….The result is that we are educating people out of their creative capacity.”

http://www.ted.com/talks/ken_robinson_says_schools_kill_creativity?language=en
What is critical thinking?

Universal Structures of Thought
- Whenever we think
  - we think for a purpose
  - within a point of view
  - based on assumptions
  - leading to implications and consequences.
  - We use data, facts and experiences
  - to make inferences and judgments
  - based on concepts and theories
  - to answer a question or solve a problem.

We do these things unconsciously

Universal Structures of Thought
- What is my fundamental purpose?
- What is my point of view with respect to the issue?
- What assumptions am I using in my reasoning?
- What are the implications of my reasoning (if I am correct)?
- What information do I need in order to answer my question?
- What are my most fundamental inferences or conclusions?
- What is the most basic concept in the question?
- What is the key question I am trying to answer?

We need to do these things more deliberately

The Critical Thinking Foundation: www.criticalthinking.org
How do we go about teaching students to improve their thinking?

- Build critical thinking into course objectives and student-learning outcomes
- Design activities and assessments that focus on the new objectives and outcomes
- Change our instructional style to match our assessment style
How can we redesign our student-learning outcomes to encourage critical thinking?

What might these student-learning outcomes look like?

Critical Thinking Learning Outcomes

- **Describe** patterns or relationships in large amounts of written and/or visual information.

- **Evaluate** information, evidence and argument for reliability and authority/usefulness (e.g., observation, testimony, measurement, experiment).

- **Identify and manage** the risks associated with making and implementing decisions.

Critical Thinking Learning Outcomes

• **Analyze and assess** the strength of an argument and the implications for a course of action that follows from it.

• **Access or generate** alternatives and select the most appropriate.

• **Develop** a clearly articulated argument to support a view and use it to justify one or more conclusions.


Critical Thinking Learning Outcomes

• **Analyze** a conflict and draw relationships with historical examples.

• **Generate** critical questions about historical examples.

• **Reflect on** the strength and weaknesses of yourself and your team members and suggest ways in which you and others could improve the work of the team in the future.

Critical Thinking Learning Outcomes

- **Select and discuss** information to produce different ways of viewing a problem.

- **Determine** the component parts of a problem/issue, their relationships to each other and to the issue/problem as a whole.

- **Develop** a rationale for performing a character in a particular way.

What kinds of activities and assessments best teach critical thinking?

How can they be achieved using the Universal Design for Learning Immersion Experience?
Types of Assignments and Assessments

- Essays
- Group exams
- Oral exams
- Debates
- Graded discussions
- Academic poster sessions
- Self-reflections (perhaps responding to specific prompts)
- Group or individual projects
- Presentations to the greater community

A Sample Assignment to do in class

- Students, in groups of four, choose the best paper, then join with a second group and choose the best of the two.

- This last paper is read to the class as a whole and a class-wide discussion is held about the strengths and weakness of the papers chosen, leading to the class voting on the best paper of the day

Try using SEEI to replace the multiple choice test

- State the concept (in a single sentence)
- Elaborate on it (“In other words,…”)  
- Exemplify it (“For example,…”)
- Illustrate it (provide a metaphor, analogy, or whatever might do the same work as a picture in a book: “It’s like…”)

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Take Advantage of Rubrics

- remove some of the ambiguity and subjectivity associated with open-ended questions
- force us to articulate what we’re looking for as we assess student work
- make the task of grading higher-order thinking exercises more manageable
Rubrics can simply be checklists

<table>
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Try integrating instructional design into your teaching

- Move away from focusing solely on conveying material
- Establish deliberate connections between student-learning outcomes, assignments, and assessments
- Infuse your course with opportunities for critical thinking
Web Resources on Critical Thinking

- [http://www.criticalthinking.org](http://www.criticalthinking.org) - The Critical Thinking Community
- [http://www.aacu.org/value/rubrics/critical-thinking](http://www.aacu.org/value/rubrics/critical-thinking) - Rubrics for critical thinking assessments
- [http://course1.winona.edu/shatfield/air/rubrics.htm](http://course1.winona.edu/shatfield/air/rubrics.htm) - A comprehensive list of rubrics for article reviews, case studies, class participation, critical thinking, essays, lab reports, presentations, and much more
- [http://www.pdx.edu/institutional-assessment-council/rubric-examples](http://www.pdx.edu/institutional-assessment-council/rubric-examples) - Portland State University rubric samples
- [http://www.foothill.edu/schedule/docs/CTRubric.pdf](http://www.foothill.edu/schedule/docs/CTRubric.pdf) - Foothill College Critical Thinking Rubric
- [http://rubistar.4teachers.org/index.php](http://rubistar.4teachers.org/index.php) - Rubric-making software
- [http://stephenbrookfield.com/Dr._Stephen_D._Brookfield/Workshop_Materials.html](http://stephenbrookfield.com/Dr._Stephen_D._Brookfield/Workshop_Materials.html) - This whole site offers great tools for critical thinking

For more contact information

Laurie Wolfley, UConn Institute for Teaching and Learning
laurie.wolfley@uconn.edu

Sally M. Dobyns, UConn ITL
<table>
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<tr>
<th><strong>4 - Exemplary</strong></th>
<th><strong>3 - Satisfactory</strong></th>
<th><strong>2 - Below Satisfactory</strong></th>
<th><strong>1 - Unsatisfactory</strong></th>
</tr>
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<tr>
<td>Purpose</td>
<td>--Demonstrates a clear understanding of the assignment’s purpose</td>
<td>--Demonstrates an understanding of the assignment’s purpose</td>
<td>--Is not completely clear about the purpose of the assignment</td>
</tr>
<tr>
<td>Key Question, Problem, or Issue</td>
<td>--Clearly defines the issue or problem; accurately identifies the core issues</td>
<td>--Defines the issue; identifies the core issues, but may not fully explore their depth and breadth</td>
<td>--Defines the issue, but poorly (superficially, narrowly); may overlook some core issues</td>
</tr>
<tr>
<td></td>
<td>--Appreciates depth and breadth of problem</td>
<td>--Demonstrates fair-mindedness toward problem</td>
<td>--Has trouble maintaining a fair-minded approach toward the problem</td>
</tr>
<tr>
<td>Point of View</td>
<td>--Identifies and evaluates relevant significant points of view</td>
<td>-- Identifies and evaluates relevant points of view</td>
<td>--May identify other points of view but struggles with maintaining fair-mindedness; may focus on irrelevant or insignificant points of view</td>
</tr>
<tr>
<td></td>
<td>--Is empathetic, fair in examining all relevant points of view</td>
<td>--Is fair in examining those views</td>
<td></td>
</tr>
<tr>
<td>Information</td>
<td>--Gathers sufficient, credible, relevant information; observations, statements, logic, data, facts, questions, graphs, themes, assertions, descriptions, etc.</td>
<td>--Gathers sufficient, credible, and relevant information</td>
<td>--Gathers some credible information, but not enough; some information may be irrelevant</td>
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<td></td>
<td>--Includes information that opposes as well as supports the argued position</td>
<td>--Includes some information from opposing views</td>
<td>--Omits significant information, including some strong counter-arguments</td>
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<td></td>
<td>--Distinguishes between information and inferences drawn from it</td>
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<td>--Sometimes confuses information and the inferences drawn from it</td>
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<td>Concepts</td>
<td>--Identifies and accurately explains/uses the relevant key concepts</td>
<td>--Identifies and accurately explains and uses the key concepts, but not with the depth and precision of a “4”</td>
<td>--Identifies some (not all) key concepts, but use of concepts is superficial and inaccurate at times</td>
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<td>Assumptions</td>
<td>--Accurately identifies assumptions (things taken for granted)</td>
<td>--Identifies assumptions</td>
<td>--Fails to identify assumptions, or fails to explain them, or the assumptions identified are irrelevant, not clearly stated, and/or invalid</td>
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<td></td>
<td>--Makes assumptions that are consistent, reasonable, valid</td>
<td>--Makes valid assumptions</td>
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<td>Interpretations, Inferences</td>
<td>--Follows where evidence and reason lead in order to obtain defensible, thoughtful, logical conclusions or solutions</td>
<td>--Follows where evidence and reason lead to obtain justifiable, logical conclusions</td>
<td>--Does follow some evidence to conclusions, but inferences are more often than not unclear, illogical, inconsistent, and/or superficial</td>
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<td>--Makes deep rather than superficial inferences</td>
<td>--Makes valid inferences, but not with the same depth and as a “4”</td>
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<td>--Makes inferences that are consistent with one another</td>
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<td>Implications, Consequences</td>
<td>--Identifies the most significant implications and consequences of the reasoning (whether positive and/or negative)</td>
<td>--Identifies significant implications and consequences and distinguishes probable from improbable implications, but not with the same insight and precision as a “4”</td>
<td>--Has trouble identifying significant implications and consequences; identifies improbable implications</td>
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<td>--Distinguishes probable from improbable implications</td>
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4 = Thinking is exemplary, skilled, marked by excellence in clarity, accuracy, precision, relevance, depth, breadth, logicality, and fairness
3 = Thinking is competent, effective, accurate and clear, but lacks the exemplary depth, precision, and insight of a 4
2 = Thinking is inconsistent, ineffective; shows a lack of consistent competence: is often unclear, imprecise, inaccurate, and superficial
1 = Thinking is unskilled and insufficient, marked by imprecision, lack of clarity, superficiality, illogically, and inaccuracy, and unfairness

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# Critical Thinking Worksheet

**Overall Score ________**

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<th>If applicable, score the element (1-4)</th>
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